LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method for controlling ~~the~~ injection of a reducing agent upstream from a catalyst ~~(4)~~ in an exhaust line ~~(2)~~ from a combustion engine ,the method comprising: ~~(1),~~ ~~characterised in~~

[[-]] ~~that~~ calculating an accumulation actual value (A1) representative of ~~the~~ a current accumulation in the catalyst ~~(4)~~ of a reducing substance forming part of or formed by the reducing agent ~~is calculated on the basis of~~ based on information from a computation model, wherein the model takes ~~which, taking~~ into account ~~the~~ expected reactions in the catalyst under prevailing operating conditions, and the model continuously determines the current state of the catalyst,

[[-]] ~~that~~ calculating an accumulation setpoint value (A2) ~~is calculated on the~~ based on ~~basis of~~ an emission setpoint value (E2) and information from ~~said~~ the computation model, ~~whereby~~ wherein the emission setpoint value (E2) is representative of a desired content, in ~~the~~ exhaust gases leaving the catalyst ~~(4)~~, of an exhaust gas substance which, as the exhaust gases pass through the catalyst, is at least partly removed from the exhaust gases by the action of the reducing substance or formed by the action of the reducing substance, and the accumulation setpoint value (A2) is representative of the reducing substance accumulation required in the catalyst under prevailing operating conditions for substantially achieving the emission setpoint value (E2),

[[-]] ~~that~~ comparing the accumulation actual value (A1) ~~is compared~~ with the accumulation setpoint value (A2), and

[[-]] controlling ~~that~~ the injection of reducing agent in the exhaust line ~~is controlled~~ based on ~~the basis of the result of~~ the comparison between the accumulation actual value (A1) and the accumulation setpoint value (A2).

2. (Currently Amended) A method according to claim 1, ~~characterised in that~~ further comprising calculating a limitation factor ($f_{constrain}$), wherein the ~~is calculated, which~~ limitation factor has a value which depends on an estimate of the current risk that the reducing substance content of the exhaust gases leaving the catalyst might exceed a predetermined limit value, ~~and in that this~~ using the limitation factor ~~is taken into account~~ in calculating the accumulation setpoint value (A2) in such a way that the accumulation setpoint value (A2) decreases in response to increasing risk that the reducing substance content of the exhaust gases leaving the catalyst might exceed the predetermined limit value.

3. (Currently Amended) A method according to claim 2, further comprising using ~~characterised in that~~ the limitation factor ($f_{constrain}$) ~~is used~~ as a multiplication factor in calculating the accumulation setpoint value (A2), wherein the limitation factor ~~and~~ is given a value which varies between 0 and 1 depending on the current risk that the reducing substance content of the exhaust gases leaving the catalyst might exceed the predetermined limit value, and wherein ~~whereby~~ the value of the limitation factor is close to 1 when there is no such risk and close to 0 when such risk is imminent.

4. (Currently Amended) A method according to claim 1, further comprising calculating an ~~characterised in that the~~ NOx conversion capacity of the catalyst under prevailing operating conditions based on ~~is calculated on the basis of~~ information from the ~~said~~ computation model and ~~is taken~~ taking the Nox conversion capacity into account in calculating the accumulation setpoint value (A2).

5. (Currently Amended) A method according to claim 1, further comprising supplying ~~any one of the foregoing claims, characterised in that~~ the accumulation actual value (A1) and the accumulation setpoint value (A2) ~~are supplied~~ to a first comparator ~~(32)~~, which emits a signal (S1) to a first regulator ~~(34)~~, ~~preferably in the form of a PI regulator,~~ wherein the [[a]] signal (S1) ~~which~~ depends on the conformity between the accumulation actual value (A1) and the accumulation setpoint value (A2), and emitting a control signal (S2) from ~~that~~ the first regulator based on ~~(34)~~

~~emits on the basis of~~ the signal from the comparator ~~(32) a control signal (S2), whereby~~ for controlling the injection of reducing agent in the exhaust line ~~is controlled~~ based on the ~~on the basis of that~~ control signal (S2).

6. (Currently Amended) A method according to ~~any one of the foregoing claims, characterised in~~ claim 1, further comprising:

[[-]] ~~that~~ determining an emission actual value (E1) ~~is determined~~ by calculation or measurement, ~~which~~ wherein the emission actual value (E1) is representative of the current content of the exhaust gas substance in the exhaust gases leaving the catalyst ~~(4)~~,

[[-]] ~~that~~ comparing the emission actual value (E1) ~~is compared~~ with the emission setpoint value (E2), and

[[-]] ~~that~~ calculating the accumulation setpoint value (A2) ~~is calculated on the basis of~~ on information from ~~said~~ the computation model and the conformity between the emission actual value (E1) and the emission setpoint value (E2).

7. (Currently Amended) A method according to claim 6, wherein ~~characterised in that~~ the emission actual value (E1) is calculated by means of ~~said~~ the computation model or on the basis of information from ~~said~~ the computation model.

8. (Currently Amended) A method according to claim 6, further comprising supplying ~~or 7, characterised in that~~ the emission actual value (E1) and the emission setpoint value (E2) ~~are supplied~~ to a second comparator ~~(42)~~ which emits a regulator signal (S3) to a second regulator ~~(44), preferably in the form of a PI regulator~~, wherein the regulator [[a]] signal (S3) ~~which~~ depends on the conformity between the emission actual value (E1) and the emission setpoint value (E2), and emitting a control signal (f_{SP}) from ~~that~~ the second regulator ~~(44) emits on the basis of~~ based on the signal from the second comparator, wherein the ~~(42) a~~ control signal (f_{SP}) ~~which is caused to affect~~ affects the calculation of the accumulation setpoint value (A2).

9. (Currently Amended) A method according to ~~any one of claims 6-8, characterised in that~~ claim 6, further comprising obtaining the accumulation setpoint value (A2) ~~is obtained~~ by multiplying ~~multiplication of two multiplication factors, whereby~~ a first multiplication factor ~~takes~~ in the form of a calculated accumulation maximum value (A_{max}) which is representative of the maximum permissible reducing substance accumulation in the catalyst under prevailing operating conditions, ~~and~~ with a second multiplication factor which depends on the conformity between the emission actual value (E1) and the emission setpoint value (E2).

10. (Currently Amended) A method according to ~~any one of the foregoing claims, characterised in that,~~ claim 1, wherein according to the computation model, the catalyst ~~(4)~~ is divided in its longitudinal direction into a multiplicity of segments, and wherein ~~whereby~~ the accumulation actual value (A1) and the accumulation setpoint value (A2) refer respectively to current and required reducing substance accumulation in the segment situated nearest to ~~the~~ an inlet end of the catalyst.

11. (Currently Amended) A method according to claim 9, wherein ~~characterised in that,~~ according to the computation model, the catalyst ~~(4)~~ is divided in its longitudinal direction into a multiplicity of segments, and ~~that~~ wherein the accumulation maximum value (A_{max}) refers to the maximum permissible reducing substance accumulation under prevailing operating conditions in the segment situated nearest to ~~the~~ an inlet end of the catalyst.

12. (Currently Amended) A method according to claim 9, further comprising calculating ~~or 11, characterised in that~~ a limitation factor ($f_{constrain}$) ~~is calculated~~, which ~~limitation factor ($f_{constrain}$)~~ has a value which depends on an estimate of the current risk that the reducing substance content in the exhaust gases leaving the catalyst might exceed a predetermined limit value, and ~~in that this~~ taking the limitation factor ($f_{constrain}$) ~~is taken~~ into account in calculating the accumulation maximum value (A_{max}) ~~in such a way~~ such that the accumulation maximum value (A_{max}) decreases in response to increasing risk that the reducing substance content of the exhaust gases leaving the catalyst might exceed the predetermined limit value.

13. (Currently Amended) A method according to claim 12, further comprising using ~~characterised in that~~ the limitation factor ($f_{constrain}$) ~~is used~~ as a multiplication factor in calculating the accumulation maximum ~~setpoint~~ value (A_{max}), wherein the limitation factor ~~and~~ is given a value which varies between 0 and 1 depending on the current risk that the reducing substance content of the exhaust gases leaving the catalyst might exceed the predetermined limit value, ~~whereby~~ and wherein the value of the limitation factor is close to 1 when there is no such risk and close to 0 when such risk is imminent.

14. (Currently Amended) A method according to claim 9, wherein ~~characterised in~~

[[-]] ~~that,~~ according to the computation model, dividing the catalyst ~~(4) is divided~~ in its longitudinal direction into a multiplicity of segments,

[[-]] ~~that~~ for each of the segments of the computation model, calculating an accumulation value (A_k) and a conversion value ($R_{max,k}$) ~~are calculated~~, ~~whereby~~ wherein the accumulation value (A_k) is representative of the maximum permissible reducing substance accumulation in the segment under prevailing operating conditions, and the conversion value (Rmax,k) is representative of the expected conversion of the exhaust gas substance in the segment when the reducing substance accumulation in the segment corresponds to the accumulation value,

[[-]] ~~that~~ summing the conversion values (Rmax,k) for the various segments ~~are summated~~, and

[[-]] ~~that~~ converting the resulting sum ~~is converted~~ to a fictitious value for the maximum permissible reducing substance accumulation in the segment situated nearest to the inlet end of the catalyst, ~~whereby this~~ wherein the fictitious value constitutes said accumulation maximum value (A_{max}).

15. (Currently Amended) A method according to claim 14, further comprising ~~characterised in that~~ for each of the segments, calculating a limitation factor ($f_{constrain,k}$) ~~is calculated~~, which ~~limitation factor~~ has a value which depends on an estimate of the current risk that the reducing substance content of the exhaust gases leaving the catalyst might exceed a predetermined limit value, and ~~that this~~ taking the limitation factor ($f_{constrain,k}$) ~~is taken~~ into account in calculating the conversion

values ($R_{max,k}$) ~~in~~ such ~~a way~~ that the conversion values ($R_{max,k}$) decrease in response to increasing risk that the reducing substance content of the exhaust gases leaving the catalyst might exceed the predetermined limit value.

16. (Currently Amended) A method according to claim 15, further comprising using ~~characterised in that~~ the limitation factor ($f_{constrain,k}$) ~~is used~~ as a multiplication factor in calculating the conversion value ($R_{max,k}$), wherein the limitation factor ~~and~~ is given a value which varies between 0 and 1 depending on the current risk of the reducing substance content of the exhaust gases leaving the catalyst might exceed the predetermined limit value, ~~whereby~~ wherein the value of the limitation factor is close to 1 when there is no such risk and close to 0 when such risk is imminent.

17. (Currently Amended) A method according to claim 14, further comprising ~~any one of claims 14-16, characterised in~~

[[-]] ~~that~~ calculating for each of the segments a value (R_k) ~~is calculated~~ for the current conversion of the exhaust gas substance in the segment,

[[-]] ~~that~~ calculating a value (R_{tot}) for the total current conversion of the exhaust gas substance in the catalyst (4) is calculated by summation of the values (Rk) of the various segments, and

[[-]] ~~that~~ converting the value (Rtot) for the total current conversion of the exhaust gas substance in the catalyst ~~is converted~~ to a fictitious value of the current reducing substance accumulation in the segment situated nearest to ~~the~~ an inlet end of the catalyst, ~~whereby this~~ wherein the fictitious value constitutes the accumulation actual value (A1).

18. (Currently Amended) A method according to claim 1, wherein ~~any one of the foregoing claims, characterised in that~~ the emission setpoint value (E2) is calculated on the basis of prevailing operating conditions.

19. (Currently Amended) A method according to claim 1, further comprising using ~~any one of the foregoing claims, characterised in that~~ at least the following parameters ~~are used~~ in the computation model when generating information for the calculation of the accumulation actual value (A1) and the accumulation setpoint value (A2):

[[-]] ~~the~~ exhaust gas temperature (P1) upstream from the catalyst,

[[-]] ~~the~~ concentration (P2) of the exhaust gas substance in the exhaust gases upstream from the catalyst,

[[-]] ~~the~~ exhaust mass flow (P3) through the catalyst, and

[[-]] ~~the~~ an amount (P4) of reducing agent injected.

20. (Currently Amended) A method according to claim 1, wherein ~~any one of the foregoing claims, characterised in that~~ urea or ammonia is used as reducing agent, whereby the reducing substance takes the form of ammonia.

21. (Currently Amended) A method according to claim 1, wherein ~~any one of the foregoing claims, characterised in that~~ the exhaust gas substance takes the form of NOx.

22. (Currently Amended) A device for ~~utilising a method according to any one of claims 1-21 for~~ controlling ~~the~~ injection of reducing agent upstream from a catalyst ~~(4)~~ in an exhaust line ~~(2)~~ from a combustion engine ~~(1)~~, ~~characterised in that~~ the device ~~comprises~~ comprising

[[-]] a first computation device operable by using a computation model to determine ~~means (20) adapted to determining~~ continuously[[,]] ~~by using a computation model,~~ the current state of the catalyst, taking into account ~~the~~ expected reactions in the catalyst under prevailing operating conditions,

[[-]] a second computation device operable ~~means (30) adapted to calculating,~~ on the basis of information from ~~said~~ the computation model[[,]] for calculating an accumulation actual value (A1) representative of the current accumulation in the catalyst ~~(4)~~ of a reducing substance forming part of or formed by the reducing agent, ~~whereby~~ the second computation ~~means (30) is likewise~~

~~adapted to calculating~~, being further operable on the basis of an emission setpoint value (E2) and information from ~~said~~ the computation model[[,]] for calculating an accumulation setpoint value (A2), ~~whereby~~ wherein the emission setpoint value (E2) is representative of a desired content, in the exhaust gases leaving the catalyst ~~(4)~~, of an exhaust gas substance which, as the exhaust gases pass through the catalyst, is at least partly removed from the exhaust gases by the action of the reducing substance or is formed by the action of the reducing substance, and wherein the accumulation setpoint value (A2) is representative of the reducing substance accumulation required in the catalyst under prevailing operating conditions in order for substantially achieving the emission setpoint value (E2),

[[-]] a comparator operable for ~~(32) adapted to~~ comparing the accumulation actual value (A1) and the accumulation setpoint value (A2), and

[[-]] a regulating device operable ~~means (34, 36)~~ for controlling ~~the~~ injection of reducing agent based on a ~~on the basis of~~ comparison between the accumulation actual value (A1) and the accumulation setpoint value (A2).

23. (Currently Amended) A device according to claim 22, further comprising a ~~characterised in that the device comprises means for~~ determining device operable by calculation or measurement for determining an emission actual value (E1) representative of the current content of the exhaust gas substance in the exhaust gases leaving the catalyst ~~(4)~~, and ~~that~~ the second computation device is operable for ~~means (30) is adapted to~~ calculating the accumulation setpoint value (A2) on the basis of information from ~~said~~ the computation model and the conformity between the emission actual value (E1) and the emission setpoint value (E2).

24. (Currently Amended) A computer program directly loadable to the internal memory of a computer, which computer program comprises program codes for implementing a method according to claim 1 ~~any one of claims 1-21~~.

25. (Currently Amended) A computer program product comprising a medium which is readable by an electronic control unit and has stored on it a computer program intended to cause an electronic control unit to implement a method according to claim 1 ~~any one of claims 1-21~~.

26. (Currently Amended) An electronic control unit ~~(50)~~ comprising an execution means ~~(51)~~, a memory ~~(53)~~ connected to the execution means ~~(51)~~, and a storage medium ~~(54)~~ connected to the execution means, ~~whereby~~ and a computer program comprising program code for implementing a method according to ~~any one of claims 1-21~~ claim 1 ~~is~~ and stored in ~~said~~ the storage medium ~~(54)~~.

27. (New) A method according to claim 1, wherein continuously determining the current state of the catalyst includes the accumulation of the reducing substance in different parts of the catalyst and the conversion of exhaust gas substance taking place in different parts of the catalyst.